J. STORY.

Apparatus for Warming and Ventilating Railroad Cars.

No. 168,426. Patented Oct. 5, 1875.

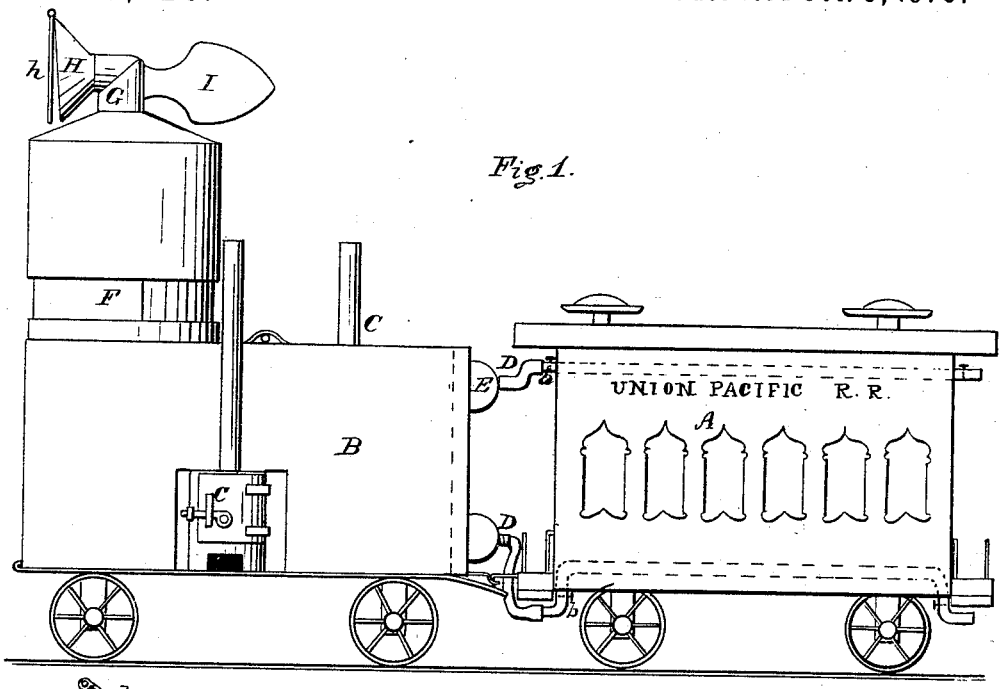

Fig. 1.

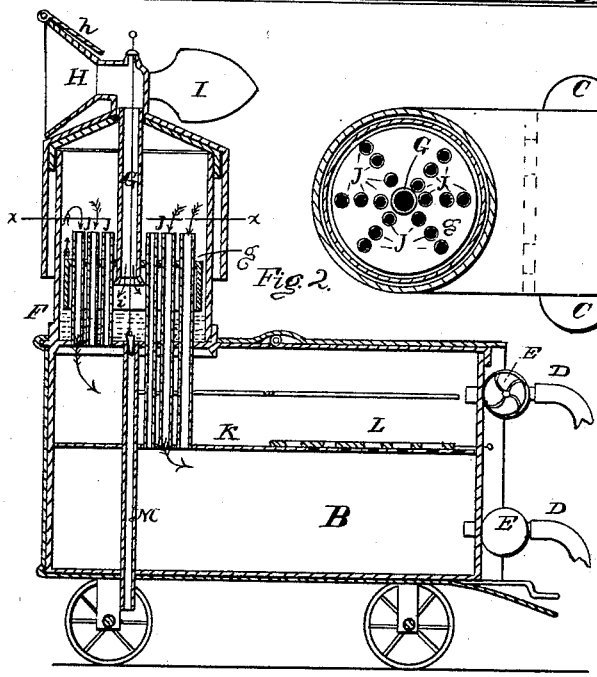

Fig. 2.

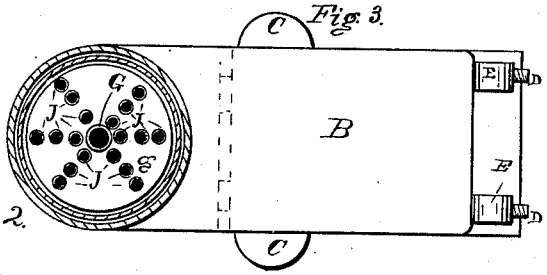

Fig. 3.

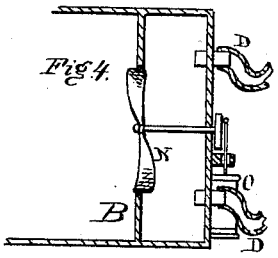

Fig. 4.

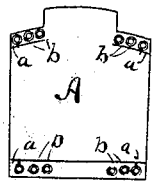

Fig. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES STORY, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN APPARATUS FOR WARMING AND VENTILATING RAILROAD-CARS.

Specification forming part of Letters Patent No. **168,426**, dated October 5, 1875; application filed September 17, 1875.

To all whom it may concern:

Be it known that I, JAMES STORY, of the city of Washington, in the District of Columbia, have invented an Improvement in Apparatus for Warming and Ventilating Railway-Carriages, of which the following is a specification:

The methods of warming railway-carriages heretofore in use have involved great danger from fire in case of accident, and also discomfort by reason of unequal temperature at the middle and ends of the car. This latter is obviated by the system of hot-water pipes in use to some extent; but the first-named danger is not thereby obviated, and the latter system involves great expense in the fitting and maintenance.

The object of my invention is to produce a more satisfactory and economical method of warming the different carriages of an entire train, and an entire avoidance of all the dangers of fire in case of accident; and to these ends it consists of an air-heating apparatus separate from the carriages of the train, from which warm air may be distributed by suitable pipes to all the carriages, employing, if necessary, an air-forcing apparatus propelled by an independent power, so that the delivery of the warm air will be entirely independent of the motion of the train. In hot weather the same apparatus may be employed to deliver cool air, ice being employed in the air apparatus, if necessary. It further consists in dividing the air-chamber into two compartments, which may be rendered separate and distinct from each other, from one of which dry warm air may be discharged at the floor, and moist warm air may at the same time be discharged near the ceiling from the other; or from the separate reservoirs air at different temperatures may be discharged.

That others may fully understand my invention I will more particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a side elevation representing my apparatus in operative condition. Fig. 2 is a longitudinal section of the same. Fig. 3 is a horizontal section on line *x x*. Fig. 4 is a section showing a single blower to force air through all the air-pipes. Fig. 5 is a transverse section of a car, showing the separate pipes.

A is one of the carriages of a railway-train. It is provided with suitable pipes *a*, or conduits for the hot air, laid in near the roof, at the floor, or in such other positions as may be proper. Said pipes are perforated or are provided with registers or outlets of crontrollable capacity for the escape of the hot air, and dampers or valves to cut off the flow, if desired; and they are also provided with imperforate pipes *b* for the conveyance of hot air to cars in the rear. The pipes of the several cars are coupled by flexible connections, which will not be disturbed by the motion of said cars. B is the hot-air generator and reservoir. It may be of such size and capacity as may be required for the service demanded. It is proposed to construct it entirely of metal, and to mount it upon its own truck, though for use upon roads running none but short trains the heating apparatus B may be mounted in a part of the baggage-car.

This heating apparatus consists, essentially, of an air-reservoir, B, and heaters or stoves C, as many or as capacious as may be required. From the reservoir B air is taken through pipes D to the carriages in the rear, and discharged therein, as indicated above.

If necessary, the blast may be forced by any suitable blowing-machine, N, worked by its own motor O, so as to make its action independent of the motion of the train; or, if more desirable, separate blowers may be employed for each pipe, as shown at E.

Air may be introduced into the reservoir B in any suitable way; but I prefer to employ the device which I will now describe. F is a vessel containing water, and G is a pipe leading therefrom to the open air above the roofs of the cars for the introduction of fresh air. Near the lower end of the pipe G there is a horizontal plate, *g*, which reaches nearly to the sides of the vessel or washer F, and has around its edge a drooping flange, which reaches down nearly to the surface of the water. When the train is in motion the water will be violently agitated and dashed into spray, filling the space below the plate *g*, which thereby constitutes a spray-chamber, *i*, into

which the air is discharged and completely washed of its dust. The pipe G is surmounted by a revolving bell, H, kept always to the wind by a vane, I, or other suitable contrivance. The air which enters the mouth or bell H passes down the pipe G, and is projected upon the surface of the water with considerable force, and completely washed by the spray, so that whatever dust or solid particles are being carried by the air will be caught by the water and retained. The air-current then rises into the upper part of the vessel or washer F, and passes into the diving-flues J J, which convey it through the bottom of the washer F and discharge it into the reservoir B. To exclude dust when the apparatus is not in use a hinged cover, *h*, is attached to the bell-mouth H.

In winter it may be desirable to supply air of different temperatures or qualities to different parts of the carriage—as, for instance, warm and dry air may be discharged at the level of the floor, and moist air, or air of a lower temperature, may be discharged higher up the side of the car, and to accomplish this result I divide the reservoir B horizontally by a diaphragm, K, which is perforated and provided with a slide, L, correspondingly perforated, so that the two compartments may, at will, be practically united, or may be kept distinct. The whole exterior surface may be jacketed with any suitable non-conductor of heat. The pipe M serves to discharge the contents of the washer F, when the water therein has become contaminated with dirt. Fresh water may be introduced through the pipe G, or by any other suitable opening. A hinged cover, *h*, closes the bell or mouth H to exclude dust, when desired.

Having described my invention, what I claim as new is—

1. A warm air reservoir, B, provided with several outlets, combined with the carriages of a railway-train, each provided with separate pipes for its own supply, and to convey air to the carriages in the rear.

2. Combined with the separate delivery-flues a warm-air reservoir, B, divided by a partition, in which there are controllable openings, for the purpose of simultaneously discharging air of the same or different temperatures or qualities from the separate compartments.

3. Combined with flues J the reservoir B, divided by the perforated diaphragm K, provided with the damper-slide L, for the purpose set forth.

4. The reservoir B, mounted upon wheels, combined with the inlet G, washer F, diving-flues J, and provided with the heating stoves or furnaces C, for the purposes set forth.

5. Combined with the washer F and the pipe G the plate *g*, with its drooping peripheral flange to constitute a spray-chamber, as set forth, to insure the thorough washing of the air, as described.

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Witnesses:
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